

AMENDMENTS TO THE SPECIFICATION:

On page 1, immediately following the title please insert a heading as follows:

BACKGROUND OF THE INVENTION

On page 1, line 5 please insert a heading as follows:

Field of the Invention

On page 1, line 10 please insert a heading as follows:

Discussion of Related Technology

The paragraph beginning on page 2, line 9 has been changed as follows:

The activation and control of functions of the various apparatuses from a central point thus provides certain advantages with regard to the handling of the work station; however, often the server provided for the input of the various control commands is positioned, from an ergonomic point of view, at an unfavourable location within a dentist's practice. For example, if a dentist now wishes to carry out a treatment procedure, the possibility of central control of the various apparatuses, from the server, is not particularly helpful for him, since the server itself is as a rule not in the vicinity of the patient chair but at a certain distance there from, possibly being arranged even in a cupboard or another room. The aid provided by means of the server, and the possibilities for central control of the various apparatuses, in this case can thus not be used at all.

On page 3, line 3 please insert a heading as follows:

GENERAL DESCRIPTION OF RELATED TECHNOLOGY

The paragraph beginning on page 3, line 4 has been changed as follows:

The ~~object of the present invention is first to indicate a possibility makes it possible to~~ activate, control and/or monitor in simple and comfortable manner, from a central location, the various functions of a plurality of apparatuses of a dentist's or dental treatment/work station. In particular the possibility is opened up of being able to use the central control or monitoring even when the dentist is or must be at a certain location of the work station.

Please delete the paragraph beginning on page 3, line 11.

The paragraph beginning on page 3, line 14 has been changed as follows:

A first aspect of the present invention relates to an input device for the activation and control of functions of at least one apparatus of a dentist's or dental treatment/work station, wherein the input device has

- a) a first input element for the generation of navigation information for the control of a pointer on a user interface, which is represented on a display of the dentist's treatment station,
- b) at least a second input element for the generation of control information, with which, independently of the navigation information generated by means of the first input element, functions of the at least one apparatus are activatable,
- c) and a transfer means device for wireless transfer of the navigation and control information generated with the aid of the first and second input elements to the apparatuses or a functional unit upstream of the apparatuses. In accordance with the invention the input apparatus is so configured that the control information generated via the second input element can be put to use independently of a unit, e.g. a central server, administering the user interface, for control of the apparatus.

The paragraph beginning on page 5, line 7 has been changed as follows:

The input device of the present invention differs from a conventional wireless mouse in the making available of a second input element, which is provided for the generation of control information, with which certain functions of the apparatuses can be activated, independently of the navigation information generated by means of the first input element. Independently of the settings of the user interface currently represented on the display, with the aid of the further information element certain functions of the apparatus can thus be purposively called up. In this way there is the possibility of calling up individual, often used,

functions of the apparatuses in a quick and uncomplicated manner - in particular without having to use the detour via the user interface. This direct control possibility, not known from US 5,724,106, is also manifest in that the control information generated with the aid of the second input element is directly transferred to the apparatus concerned or to a so-called functional unit, and there put into action. The second input element can thus in particular be used independently of a server administering the user interface.

The paragraph beginning on page 5, line 22 has been changed as follows:

The second input element preferably ~~comprises~~ includes a function key field having a plurality of function keys, with which the individual desired functions of the apparatuses can be activated. Preferably at least [[a]] part of the function keys are provided for the purpose of selecting an image source desired for representation on a display of the work station, whilst in contrast with other keys the type of the representation can be influenced. Of course, the function keys can however also be associated with other functions.

The paragraph beginning on page 8, line 20 has been changed as follows:

From the plurality of input signals made available there can thus be selected and provided for display the output signal which contains the desired image information. This function is achieved by ~~means of~~ a first transfer unit, designated in the following as a video matrix, which switches a plurality of different input video signals in any desired manner and independently of one another to different video outputs. Since at least some of the video signals as a rule are also combined with audio signals, there is preferably provided a further so-called audio transfer unit or audio matrix which in the same manner as in the video matrix switches the audio input signals to the corresponding outputs. Supplementary thereto there

can finally also be put to use a second transfer unit as so-called VGA matrix, with which different VGA input signals - or general image signals corresponding to a PC-standard – can be switched independently to different VGA outputs. This VGA matrix can be employed for representing on the display or displays of a work station, image information obtained from various computers or servers.

The paragraph beginning on page 9, line 17 has been changed as follows:

A further module preferably provided in the interface unit is a digital processing unit with the aid of which image signals can be processed and issued in a modified form. This digital processing unit may for example be provided for the purpose of producing still images from certain video items, which are then represented on the or a further supplementary display. Also the simultaneous representation of a plurality of images, also of a single screen, is made possible through this. Further, by means of the processing unit in particular also a live conversion of analog video images to VGA data is made possible, so that these images can now also be directly represented, i.e. without the intermediary of a PC, on a monitor.

On page 10, line 11 please insert a heading as follows:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 11, line 9 please insert a heading as follows:

DETAILED DESCRIPTION

The paragraph beginning on page 11, line 21 has been changed as follows:

The work of the various apparatuses is primarily coordinated or monitored by means of a central server 40, which is arranged usually at a certain distance from the treatment chair

10, for example in a cupboard or even in a special room of the practice. The control of the various apparatuses is thereby effected at least in part with the aid of the functional unit 41, which in a wireless manner transfers control commands to the various apparatuses, or receives data from these apparatuses. The more precise functioning of this functional unit 41 will be described in more detail below. It is further connected both with the server 40 and also with further functional units 113, 213 (if applicable, arranged in other rooms of the practice) via additional data or video lines 45, via which the signals containing video and image information can be transferred. Through this a kind of a practice-internal network is realized, with the aid of which image information made available from various sources can be selectively represented on the displays 13, 113, 213 associated with the three functional units 41, 141, 241.

The paragraph beginning on page 12, line 14 has been changed as follows:

First, it is possible to directly call up and, if applicable, activate certain selected functions of individual apparatuses. For example, by means of a single command, the optical diagnosis apparatus 11 could be started, the treatment chair 10 brought to a certain initial position, or a certain image signal delivered to the display 13. Other functions of the apparatus require, however, the additional indication of certain parameters, in order to be able to activate these functions in a desired manner. Thus, for example, a simple switching on of a dental X-ray apparatus would not be sufficient, since beyond this also information with regard to the required dose or the desired exposure time must be transferred.

The paragraphs beginning on page 13, line 14 have been changed as follows:

In accordance with a first aspect of the present invention, the central control of the various apparatuses is however facilitated by means of the employment of an input device 50,

with the aid of which control information can be input and transferred to the various apparatuses in a wireless manner. The input device 50, the configuration of which will be described in more detail below, stands in contact with the functional unit 41 via a transmitter and receiver unit 51, which receives information transferred from the input device 50 and in appropriate manner passes this on as control commands to the apparatuses of the treatment or work station or to the server 40. The functional unit 41 thereby stands in contact with the server 40 via a USB interface, in order to fully make use of the possibilities of central control of the various apparatuses.

Components of the functional unit 41 are first a transmitter and receiver unit 42, a controller 43, a so-called USB hub 44, establishing the connection to the server 40, and the above-mentioned interface unit 16 for the control of the associated display 13. The connection between the functional unit 41 and the server 40 is in particular necessary since a quantity of the information received from the operating unit 50, in particular when the information concerns the control or monitoring of an apparatus within the framework of a user interface represented on a display, must first be processed by means of the server 40 before it is passed on, if appropriate as corresponding control commands, to the apparatuses. For this purpose there serves the internal controller 43 of the functional unit 41, which passes on the information received from the server 40 to the transmission and reception module 42. The interface unit 16 is also controlled by the controller 43. Thereby it is to be taken into account that, with the described exemplary embodiment of the present invention, also control of the apparatuses 10, 11, 12 is effected via the server 40, whereby there is transferred to these apparatuses 10, 11, 12 control commands issued by the server 40 by means of the functional unit 41, which commands are appropriately acted upon by the apparatuses 10, 11, 12. A simplified version would, however, also be conceivable of employing the server 40 solely for the monitoring of the apparatuses 10, 11, 12 and for documentation. The

apparatuses 10, 11, 12 would then receive no control commands from the server 40 but solely for their part transfer information via the functional unit 41 to the server 40, which would then be represented on the display. This information could relate both to the current operating condition of the apparatuses 10, 11, 12 and also to measurement results, e.g. the image data detected by an intra-oral camera. At least a partial control of the apparatuses 10, 11, 12 could, in this case, still be effected via the selection keys of the input device 50, the control information of which – as explained above, is passed on independently of the server 40.

The paragraph beginning on page 17, line 1 has been changed as follows:

It can be understood from the enlarged illustrations in Figures 2 and 3, that the first input element has a navigation element 53 for the generation of two-dimensional navigation information, and additional selection keys 54a to 54d for the generation of supplementary selection information. The navigation element is, in particular, a joystick 53, which is activated to initiate a synchronous movement of a pointer on the user interface. If a user holds the input device 50 in the hand, he can tilt the joystick 53 with the aid of his thumb in simple manner in the desired direction, in order to navigate the pointer in accordance with the selected direction over the user interface. In this sense, the joystick 53 assumes the function of a conventional computer mouse. In order to further complete this "simulation" of a computer mouse, the supplementary selection keys 54a to 54d are provided, which are arranged to the four sides of the joystick 53. By means of pressing down of the input element 52 in the region of one of the selection keys 54a to 54d, supplementary selection commands can be generated and transferred. In particular thereby, the functions of the right and left selection keys 54a and 54c correspond to the functions of the right and left mouse keys. The first input element 52 thus offers all functions which arise in similar manner with a conventional computer mouse.

The paragraph beginning on page 20, line 13 has been changed as follows:

The right key 58 finally serves exclusively to change from the above-described navigation mode into a so-called menu mode, in which the further navigation through the user interface represented on the display 13 is effected not on the basis of two-dimensional displacement of a pointer but by ~~means of~~ the change between various menu points. This menu mode also has effect on the functioning of the first input element 52, since hereby only the four selection keys 54a to 54d are active and serve the purpose of changing to a right, left, upper or lower menu point. The joystick 53 itself is inactive during the menu mode and the serial RS232 interface is blocked.

The paragraph beginning on page 24, line 15 has been changed as follows:

Since the association of the different image information to the various displays within the treatment room or the overall practice is, with the employment in each case of separate lines and cables, complex and liable to faults, there will be described below a possibility of associating the various image information with individually determined displays. This task is fulfilled by ~~means an~~ interface unit 16 connected upstream of the displays 13, 113 and 213, which interface unit is to be described below in more detail with reference to Figs. 6 and 7.

The paragraph beginning on page 24, line 1 has been changed as follows:

Internally, the processing unit 73 has, corresponding to the illustration in Fig. 7, for this purpose first a translation block 73a, which transforms the analog video signal into a digital signal. The digital signal can then be selectively processed in a processing block 74, whereby corresponding to the representation the possibilities "Freeze", "Mirror", "Quad" and "Deinterlacing" are available. The video signal processed in this manner may be then either –

after preceding conversion into an analog signal by means of a further conversion block 73b – again be delivered to the video matrix 70 and via this delivered to one of the two video outputs or to further conversion blocks 75 and 76. These further conversion blocks 75 or 76 are responsible for forming from the digital video signal a signal corresponding to the VGA standard or the DVI (Digital Video Interface) standard. The VGA signal can then be delivered to an output (VGA DISPLAY) which is for example connected with a computer monitor, whereas in contrast the DVI signal can be delivered to a further output (DVI DISPLAY). Significant here is that the processing unit 73 opens up in particular also the possibility of converting the input side analog video data “live” into signals corresponding to the VGA standard, so that without the intermediary of a further apparatus an immediate representation also of moving images is made possible on a monitor.

The paragraph beginning on page 25, line 16 has been changed as follows:

The employment of this interface unit 16 now opens up the possibility of connecting various displays, which are arranged in one or different practice rooms, with one another via a network. For example, in a central location a media sever can be established, which is a PC or a video apparatus such as e.g. a DVD or a video player, the output signals (video and audio) of which are transferred to a first work station and from there to the further praxis rooms, more precisely to the further interface units located in these practice rooms. Through this it can be ensured that at each work station the same video item is shown. This possibility of networking is made possible, as illustrated in Fig. 1, by means of the connection of a plurality of functional units with the interface units arranged therein. Thereby, for example, the functional units 141, 241, with the displays 113, 213 associated therewith, may be arranged in other rooms of the practice, whereby via the lines 45 the network for the selective passing on of the image and audio information is constituted.

The paragraphs beginning on page 26, line 13 have been changed as follows:

By means of the interface unit in accordance with the invention the passing on of video and audio signals is thus significantly facilitated. In particular, it is no longer necessary in each case to lay a plurality of lines from one image producing unit to the various display or representation units.

Thus, overall, the present invention opens up the possibility of realizing a dentist's or dental work station or treatment station which is comfortable to operate. Thus, a central control of the various apparatuses is made possible with the aid of a remote control, by means of which the advantages of networking of the apparatuses with one another can be effectively exploited. At the same time the most varied image-representing data can be coupled out in desired manner or delivered to determined display or representation units, so that diverse possibilities for the representation of image representing information are attained.